



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,858	07/12/2006	Yusuke Fukuoka	900-556	7745
23117 7590 11/16/2009 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
FORD, NATHAN K				
ART UNIT		PAPER NUMBER		
1792				
MAIL DATE		DELIVERY MODE		
11/16/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/585,858

Applicant(s)

FUKUOKA ET AL.

Examiner

NATHAN K. FORD

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/3/09.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 16-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 16 and 20-26 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 17-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Applicant's Response

Acknowledged is the applicant's response received August 3, 2009. Claims 1, 3-4, and 6-9 are amended; claims 10-15 are canceled; claims 16-26 are new. The 112 rejection to claim 7 is withdrawn.

The applicant contends:

(1) The skilled artisan would not be motivated to position a tray underneath a substrate in Hassan's system. When the tray traverses an inclined section of track, the wafer will likely slide off.

(2) The element of Hassan designated by the examiner as a conveying arm is in fact part of a mechanism used to tilt a portion of the conveyor track. The reference does not elaborate a conveying arm which transports a wafer through a plurality of chambers.

In response:

(1) It is the examiner's position that the coefficient of friction between the substrate and tray can be made sufficiently high such that slippage will not occur during the traversal of modest grades.

(2) The examiner acknowledges that the conveying arm of Hassan does not directly engage a tray (and has indicated allowable those claims which recite this feature), but also notes that claim 1 does not require this type of communication. Hassan's conveying arm, by tilting sections of the track, facilitates the movement of the substrates and in this way "moves" a tray from vacuum chamber to vacuum chamber without directly engaging a recess formed on the tray surface.

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on January 30, 2004. As the International Bureau has not provided a certified copy of the foreign priority application, the applicant is requested to file a certified copy of the Japanese application as required by 35 U.S.C. 119(b).

Specification

The substitute specification filed 8/3/2009 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because: it is not accompanied by a statement that the substitute specification contains no new matter, as required by 37 CFR 1.125(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 22-23 and 25-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 22 recites the feature of a third conveying arm which moves a tray from a third vacuum chamber to a fourth vacuum chamber. However, the original disclosure does not provide support for a third conveying arm. The applicant's specification does describe an embodiment comprising four vacuum chambers, but only two conveying arms (360a, b) are disclosed as being necessary to pass the tray through the chambers [0120ff].

Claim 25 recites the feature of engagement parts located on the side edges of the tray. The original disclosure only provides support for engagement parts (52) formed on the top surface of the tray (Fig. 1), not for engagement parts formed on a side edge.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 7, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hassan et al., US 4,348,139, in view of Iwasaki et al., US 5,174,881.

Claims 1, 7: Hassan discloses a semiconductor processing apparatus comprising:

- A plurality of vacuum chambers for processing a substrate (4, 9-34; Fig. 1);
 - Wherein an exhaust device must be inherently connected to each chamber to effect a vacuum (9, 53-57);
- A guide plate arranged at the bottom of each vacuum chamber (Fig. 10b);
 - Wherein each plate has a plurality of gas emission holes (124) (5, 40ff; 9, 45-50);

- o Wherein a gas supply source must be present inherently to provide gas to the emission holes;
- A substrate mounted on the guide plate;
- A conveying arm (52) attached to a rotatable section (30) which facilitates wafer rotation and incline (4, 58ff; 7, 46-65; 9, 13-35);
- Wherein a shutter (123) is disposed between the vacuum chambers (9, 45-50);
- A mechanism which controls (9, 45-65):
 - o The opening of the shutter;
 - o The emission of gas through the emission holes;
 - o The movement of the tray, whereby the tray is floated by the emitted gas, from the guide plate of one chamber to the guide plate of an adjacent chamber via the conveying arm.

Hassan does not interpose a tray between the guide plate and the substrate as required by the applicant's claim. Hence, Iwasaki is cited in supplementation (Fig. 11). The secondary reference elaborates a semiconductor processing system wherein multiple wafers (4) are disposed atop a tray (30) which is conveyed along a track through a plurality of vacuum chambers (18, 57ff). This arrangement augments throughput by increasing the number of wafers that can be transported per unit time. Given this teaching, it would have been obvious to one of ordinary skill reconfigure the system of Hassan such that multiple wafers are conveyed on a single, floatable tray to accelerate processing.

Claim 2: As described above, the movements of the shutter and rotatable section are controlled. Further, the air provided through the holes of the conveyance track is carefully modulated, and to achieve such control each structural feature recited by the applicant (supply source, valve, detecting part, etc.) must be inherently present within the system of Hassan (5, 40ff; 9, 13ff).

Claims 21-24: As depicted by Figure 1 of Hassan, the vacuum chambers are arranged in a straight line, and the conveying arms facilitate the movement of the trays therethrough. Concerning the precise number of conveying arms: It has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (*St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8).

Claims 3 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Hassan in view of Iwasaki and in further view of Rigali et al., US 2004/0211516.

The previously cited prior art does not articulate a locking means. Rigali, however, discloses a track for workpiece conveyance outfitted with guide rails into which locking edges are inserted; this configuration ensures the alignment

of the workpieces traversing the track [0059]. Given this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate guide rails within Hassan's apparatus to prevent any undesirable sideways movement (relative to the intended direction of conveyance) of the tray.

Claims 4-6 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hassan in view of Iwasaki and in further view of Baxter et al., US 2002/0139481.

Claims 4-6: The drive section of Hassan does not avail pulleys and wire to boget the rotation and incline of the rotatable sections. Even so, as Baxter demonstrates, it is well-known in the art to employ pulley mechanisms in the context of wafer conveyance. Specifically, Barraud employs two pulleys (70) to facilitate the manipulation of a substrate support arm and the rotation of substrate itself [0034, 37]. As would be apparent to one of ordinary skill, it would have been obvious to control the tension of the pulley wire to direct the movements of the conveying arm. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to manipulate the conveyance arm of Hassan via pulley mechanisms to achieve the predictable result of transporting and rotating a substrate.

Claim 20: As depicted by at least Figure 2 of Hassan, the distance between the chambers (20, 21) is greater than the range of the conveying arm (Figs. 5).

Allowable Subject Matter

Claims 8-9 and 17-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. It should also be noted that the limitations of claim 19 alone, if incorporated in claim 1, would overcome the teachings of the prior art.

Claim 8 recites at least two engagement part formed on the tray so as to engage the conveying arm as the tray is being transported. Hassan does not disclose a tray formed with engagement parts, nor is the conveying arm articulated by the primary reference intended to engage any component traversing the surface of the air track. Rather, Hassan's conveyance arm engages with an undersurface of the rotatable section to permit its rotation and incline. As the intended purpose of Hassan's system is to transport wafers merely by the use of air pressure, that is, transport without the requirement of direct engagement between a conveyance arm and a substrate, the primary reference teaches away from any combination that would incorporate a mechanical component which directly

contacts an element traversing the topside of the air track. For these reasons, the prior art, neither alone nor in combination, anticipates the features recited by applicant's claims 8-9 and 17-19.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Ford whose telephone number is 571-270-1880. The examiner can normally be reached on M-F, 8:30-5:00 EDT. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland, can be reached at 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/N. K. F./

Examiner, Art Unit 1792

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792